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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/690,183	10/17/2000	Tadayoshi Kachi	TALW-0152	1660

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EXAMINER
RIOS CUEVAS, ROBERTO JOSE

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 05/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/690,183	Applicant(s) KACHI ET AL.	
	Examiner Roberto J Rios	Art Unit 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *5-9* is/are allowed.

6)☒ Claim(s) *1,2,4 and 11-16* is/are rejected.

7)☒ Claim(s) *3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Schneider et al (US patent 6,271,645).

As per claim 1, Schneider et al (herein after Schneider) teach a method of supplying power using a main DC power supply for generating a predetermined voltage to supply a first output voltage substantially equal to the predetermined voltage and a second output voltage lower than the predetermined voltage, comprising the steps of: connecting a first DC power supply (18) for generating the same voltage as the second output voltage in series to a second DC power supply (20) for generating a differential voltage between the first output voltage and the voltage from the first DC power supply, thereby forming the main DC power supply; connecting a DC-DC converter (30) to the second DC power supply; and stepping down the voltage output from the second DC power supply to produce the second output voltage by using the DC-DC converter (Figure 1).

As per claim 2, Schneider teaches a power converting apparatus for generating a first output voltage and a second output voltage lower than the first output voltage, comprising a first DC power supply (18) for generating the same voltage as the second

output voltage; a second DC power supply (20) connected in series to the first DC power supply, for generating a voltage corresponding to a difference between the first output voltage and the voltage from the first DC power supply; and a DC-DC converter (30) connected to the second DC power supply, for converting the voltage from the second DC power supply to the second output voltage (Figure 1).

As per claim 11, Sullivan teaches a power converting apparatus for a motor driven vehicle, comprising: a main battery assembly, connected between a high potential power supply and a low-potential power supply for generating a main output voltage for driving the vehicle motor, the main battery assembly including a first battery cell (18) for generating a first voltage lower than the main output voltage, and a second battery cell (20), connected in series to the first battery cell, for generating a second voltage corresponding to a difference between the main output voltage and the first voltage; and a DC-DC converter (30) connected to the second battery cell, for converting the second voltage to a low voltage substantially equal to the first voltage (Figure 1).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider.

As per claim 4, Schneider teaches a voltage converter but does not specifically disclose the voltage converter comprising an insulating voltage converter. However, the Examiner takes official notice that insulated step-down dc/dc converters are well known in the art.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Schneider such that an insulating converter is used for the purpose of providing better noise reduction in the system.

5. Claims 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider in view of Sullivan (US patent 5,528,122).

As per claim 12, Schneider teaches a first and second current sensors for detecting a main output current and a low voltage source current respectively, wherein the converter voltage output is controlled based on said current signals. Schneider does not specifically disclose using voltage sensors and the internal components of said voltage converter. However, Sullivan teaches a power converting apparatus comprising a first voltage sensor for detecting a main output voltage, and a second voltage sensor for detecting a low voltage (col. 8, line 37); and wherein a DC-DC converter includes: a switching element responsive to a control signal; an inductance connected in series to the switching element; and a control circuit, connected to the switching element and the first and second voltage sensors (Figure 4), for supplying the switching element with the control signal for controlling ON and OFF actions of the switching element based on detection signals from the first and second voltage sensors (col. 8, line 40).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Schneider with the teachings of Sullivan such that the claimed dc-dc converter is used for the purpose of ensuring proper equalization between the batteries.

As per claim 13, Sullivan teaches the switching element including a MOSFET (Figures 3, 4).

As per claim 14, Sullivan teaches the control circuit including: a triangular wave oscillator for generating a triangular wave signal having a predetermined cycle; and a comparator for comparing a difference between detection signals from the first and second voltage sensors with the triangular wave signal and generating a pulse signal according to a comparison result, wherein the control circuit sends the pulse signal as the control signal to the switching element (Figure 6; col. 10, line 49).

As per claim 15, Sullivan teaches the control circuit controlling a ratio of an ON time of the switching element to an OFF time thereof by changing a pulse width of the pulse signal, thereby adjusting a level of the low voltage (col. 9, line 47).

As per claim 16, Sullivan teaches the comparator generating a high-level pulse signal when the difference between the detection signals from the first and second voltage sensors is greater than the triangular wave signal and generates a low-level pulse signal when the difference between the detection signals from the first and second voltage sensors is smaller than the triangular wave signal (col. 10, line 54).

6. Art of general nature relating to power converting apparatus has been cited for applicant's review.

Allowable Subject Matter

7. Claims 5-9 are allowed.

8. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach or fairly suggest a power converting apparatus comprising a low voltage dc supply and a high voltage dc supply connected in series, wherein a polarity inverting dc-dc converter is connected to the low voltage dc supply as in the claimed combination of elements recited in claims 3 and 8 respectively. Moreover, the prior art of record fails to teach or fairly suggest a method and a power converting apparatus comprising a dc supply; a step-up dc-dc converter connected to said supply for producing a voltage between a dc supply voltage and a target boosted voltage, wherein said target boosted voltage is obtained by adding the voltage of said dc supply and the output of said step-up dc-dc converter as in the claimed combination of elements recited in claims 5, 6 and 7 respectively

Response to Arguments

10. Applicant's arguments with respect to claims 1, 2 and 11 have been considered but are moot in view of the new ground(s) of rejection.

Communication with PTO

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberto Rios whose telephone number is (703) 306-5518. In the event that Examiner Rios cannot be reached, his supervisor, Brian Sircus may be contacted at (703) 308-3119. The fax number for Before-Final communications is (703) 872-9318, for After-Final communications is (703) 872-9319, and for Customer Service is (703) 872-9317.

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Roberto J. Rios
Patent Examiner